

Remarks

Drawings

The Examiner has objected to the drawings under 37 C.F.R. 1.83(a), because the “heat-conducting member having one or more relief volumes including the lower surface defining the relief volumes (claims 1 and 13) must be shown or the feature(s) cancelled from the claim(s).”

In response, the Applicant has amended Figure 2 to show relief volumes 50 on the lower surface 21 of member 20, consistent with the amended Specification. No new matter has been added to Figure 2 or to the Specification. A Replacement Sheet for Figure 2 has been included.

Claim Rejections

The Examiner has rejected claims 1-3 and 5-14 under 35 U.S.C. 103(a) as being unpatentable over Shah et al. (US 5,127,837) in view of Andric et al. (US 6,504,243).

Claim 1:

In support of the rejection of independent claim 1, the Examiner states Shah et al. teach “a system for coupling a heat sink to an electrical device independently of a clamping member that is used to place a coupling force between one or more electrical devices and a substrate to which the one or more electrical devices are to be electrically connected, the system comprising: a clamping member (Fig. 2, #14, #52, #54 and Fig. 10, #63) adapted to push (col. 9, lines 1-2) the one or more electrical devices (Fig. 10, #12) against the substrate (Fig. 9, #68), to assist in electrical connection between the one or more electrical devices and the substrate, the clamping member defining a through-hole (Fig. 1, for #55 in #52 and Fig. 10, #63) leading to each electrical device; a heat-conducting member (Fig. 1, #55 and #56) in a through-hole of the clamping member and adapted to thermally contact the electrical device to conduct heat into or

out of the electrical device having a lower surface (#56 bottom); a resilient member (col. 7, line 32) located within the clamping member through-hole in which the heat-conducting member is located, for urging the heat-conducting member into thermal contact with the electrical device; and a heat sink (Fig. 1, #58) in thermal contact with the heat-conducting member.”

The Examiner further states, “Shah et al. fail to teach a lower surface of the heat-conducting member having one or more relief volumes. Andric et al. teach a lower surface (Fig. 4, #56 lower surface) of the heat-conducting member (#56) includes one or more relief volumes (relief in #56 for #60) that prevent the lower surface of the heat-conducting member from contacting a top surface of one or more components of the electrical device.”

In response to the Examiner’s rejection, the Applicant respectfully contends that Andric et al. does not disclose a lower surface of the heat-conducting member including one or more relief volumes that *prevent* the lower surface of the heat-conducting member *from contacting* a top surface of one or more components of the electrical device.

Rather, as shown in Figure 4 of Andric et al., heat transfer apparatus 50 has “an upper wall of the cavity *dimensioned to receive* IC 60.” (col. 6, lines 14-17). The portion of heat sink 50 identified by the Examiner as the relief volume is intended to accommodate IC 60, not *prevent* heat sink 50 from contacting a top surface of one or more components of IC 60. Andric et al. even notes that in this configuration, “heat sink 56 of heat transfer apparatus 50 is in more effective thermal communication with both the IC and the substrate....”

Claim 1, then, is clearly patentable over the cited reference.

Claims 2-3 and 5-12:

Claims 2-3 and 5-12 are dependent on claim 1, and as such are patentable for at least the

same reasons set forth above for claim 1.

Claim 13:

In support of the rejection of independent claim 13, the Examiner states Shah et al. teach “a system for coupling a heat sink to an electrical device having one or more components independently of a clamping member that is used to place a coupling force between one or more electrical devices and a substrate to which the one or more electrical devices are to be electrically connected, the system comprising: a clamping member (Fig. 10, #63) adapted to push (col. 9, lines 1-2) the one or more electrical devices (Fig. 10, #12) against the substrate (Fig. 9, #68), to assist in electrical connection between the one or more electrical devices and the substrate, the clamping member defining a through-hole (Fig. 1, for #55 in #52) leading to each electrical device; a heat-conducting post (Fig. 1, #55) in a through-hole of the clamping member with an enlarged end (Fig. 1, #56) adapted to thermally contact the electrical device to conduct heat into or out of the electrical device; a heat sink (Fig. 1, #58) in thermal contact with the heat-conducting post; and a spring (see Fig. 1 and col. 7, line 32) in the through-hole in the clamping member adapted to be compressed between the clamping member and the enlarged end of the post, to assist in thermal contact between the enlarged end and the electrical device.”

The Examiner further states, “Shah et al. fail to teach a lower surface of the heat-conducting member having one or more relief volumes. Andric et al. teach a lower surface (Fig. 4, #56 lower surface) of the heat-conducting member (#56) includes one ore more relief volumes (relief in #56 for #60) that prevent the lower surface of the heat-conducting member from contacting a top surface of one or more components of the electrical device.”

In response to the Examiner’s rejection, the Applicant respectfully contends that Andric

et al. does not disclose a lower surface of the heat-conducting member including one or more relief volumes that *prevent* the lower surface of the heat-conducting member *from contacting* a top surface of one or more components of the electrical device.

Rather, as shown in Figure 4 of Andric et al., heat transfer apparatus 50 has “an upper wall of the cavity *dimensioned to receive* IC 60.” (col. 6, lines 14-17). The portion of heat sink 50 identified by the Examiner as the relief volume is intended to accommodate IC 60, not *prevent* heat sink 50 from contacting a top surface of one or more components of IC 60. Andric et al. even notes that in this configuration, “heat sink 56 of heat transfer apparatus 50 is in more effective thermal communication with both the IC and the substrate....”

Claim 13, then, is clearly patentable over the cited reference.

Claims 14:

Claim 14 is dependent on claim 13, and as such is patentable for at least the same reasons set forth above for claim 13.

Each of the Examiner's rejections has been addressed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the

undersigned in Westborough, Massachusetts, (508) 898-1501.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Brian M. Dingman', with a stylized, overlapping script.

Brian M. Dingman

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